results have been obtained, but this is I think to be explained by the fact that the quantity of spore material varied, as might be expected in each case.

In the case of hydronaphthol-treated spores washed only in water, no growth resulted in the case even of those only exposed to it for ten minutes.

From a consideration, therefore, of the preceding experiments, it is to be noted that the two principles of prophylaxis and cure of sepsis in surgery are each specifically distinct from the other, and further, that certain agents capable of being used efficiently as prophylactic against are absolutely useless as curative agents of sepsis, if once it gets a start in a wound. In other words, germicide and antiseptic are two very different terms.

Further, between the minimum and maximum actions of any special antiseptic we have carefully to differentiate, as we see that the minimum is easily vanquished, and it is upon the former that we have mostly to rely in practice.

We have thus seen that the maximum antiseptic action of corrosive sublimate lies very nearly at 1 in 4,800, while the minimum is 1 in 10,000. In the case of hydronaphthol, the minimum is somewhere about 1 in 7,200, while the maximum lies between 1 in 2,500 and 1 in 3,000.

Carbolic acid used with the steam spray is undoubtedly an efficient agent, if proper care and assistance be at hand; but in hospital practice very many circumstances, in some cases, combine to render futile all attempts at antiseptics in this way. As the result of careful observation, I should say that the carbolic spray is most likely to render efficient service in private practice, when it and its surroundings can be kept under the personal supervision of the surgeon himself, but should be dispensed with in hospital practice if a more stable substitute can be readily obtained.

If carbolic acid is to be used as a disinfectant for instruments, sponges, etc., it is evident from Koch's statements that they must be immersed in 1 in 20 lotion for at least two days. If this be impracticable, the other alternative is to boil them for an hour in water beforehand, and then to immerse them in lotion. But we also have to note that the tray containing the instruments must itself be aseptic, and this can not well be if the lotion is simply put into it just before the instruments, and suggests the necessity of having the lotion in for a long period beforehand. This, of course, will appear to many as an excess of fastidiousness, but, if we are to follow the dictates of science, it is absolutely necessary; not only so, anything short of this is simply to court failure.

The use of carbolic acid for washing out wounds is at best a dangerous method of procedure. I have already shown that, as the result of the action of 1 in 20 carbolic lotion upon muscular tissue and blood, there is formed a viscous or glue-like mass, and thus, if applied to a wound, there is formed on the surface of it a distinct layer of necrosed material. This, like most dead tissues, forms a suitable nidus for the growth of bacteria. Supposing, then, that carbolic irrigation be efficient in destroying the micro-organisms in a wound, this necrotic area has still to be cast off, and contributes in this way a form of suppuration, during the progress of which excessive care will have to be taken in order to prevent the entrance of fresh bacteria. But as it happens that such a proceeding is hardly likely to be successful, the surgeon using this method simply makes matters worse, in that, while he does not destroy sepsis, he ministers directly to it by giving the micro-organisms pabulum on which to feed. Thus we see that carbolic irrigation, instead of tending in the direction of the cure of sepsis, predisposes indirectly to pyæmia and septicæmia.

Coming to consider the uses of corrosive sublimate, we have to note that it also causes the formation of a necrotic area if used for irrigation, but in a different way from carbolic acid. In the case of carbolic acid, the fluid left is still carbolic acid, although its strength may be considerably reduced; but in the case of corrosive sublimate the mercuric salt is almost entirely decomposed, and in the tissues we have a distinctly noxious agent left in the form of the albuminate of mercury, which, being soluble in excess of albumen, is thus liable to be absorbed. This, of course, inhibits the free use of this agent in the case of large wounds. Corrosive sublimate is undoubtedly useful as a preservative of distilled water, and thus fulfils its functions admirably when used by bacteriologists for moistening the filter paper in plate-cultivation apparatus, but its use should be restricted to such and like purposes, for even if ordinary water be used instead of distilled, the mercuric salt is soon reduced, as Klein has shown.

We now come to consider the new antiseptic, hydronaphthol, and I shall explain immediately what it is. I have already shown that for antiseptic purposes it is, when dissolved in ordinary water, not much more than half as powerful as corrosive sublimate is when dissolved in distilled water; but, under such circumstances as the surgeon meets with, it is much more powerful than corrosive (see Table V). Further, as it is non-poisonous, a saturated watery solution of 1 in 1,000 may be freely made use of.

Considered from the point of view of a germicide, it is seen that it is at least as powerful as corrosive sublimate for anthrax and more so for bacillus subtilis, when the latter even is being used under conditions most advantageous to it. I have given 3 grains in one day, and repeated it on three occasions successively to guinea-pigs without any effect, and I have myself taken it without experiencing any result whatever. It is further reported that doses of 15 grains have been given without any untoward symptoms whatever. Looked at in this way, the use of hydronaphthol is suggested to us as an internal antiseptic, and I have indeed made several experiments with it upon animals which, though encouraging in their results, do not warrant me in giving a definite expression of opinion. There can, however, be no doubt of the fact that in this agent we have an ideal antiseptic.

Hydronaphthol was discovered by Dr. Justus Wolf, of New York, only a few years ago. It is a secondary compound of betanaphthol, differing from it in having a molecule of hydrogen displaced by an equivalent of hydroxide. Its formula is $C_{10}H_7OH$.

The material I have used is that made by Messrs. Seabury and Johnson, and I have found it most convenient either to make use of a solution in alcohol in which it is soluble to the amount of 1 in 2 parts, or with glycerine added to the alcoholic solution so as to make it of the strength of 1 in 10. It is soluble in oil to the extent of 1 in 20, but is only dissolved in cold water to the amount of 1 in 1,100. In making use of a watery solution of 1 in 1,000, I had always to see that the water was kept lukewarm. A solution of 1 in 300 in warm water possesses very great germicidal powers, and such will be found of the greatest service in washing out septic cavities and wounds.

ON THE SEVERE VOMITING OF PREGNANCY.¹

By GRAILY HEWITT, M.D.,

Emeritus Professor of Obstetric Medicine in University College, London;
Honorary Fellow of the American Gynecological Society.

In this paper are analysed facts and cases elucidative of the pathology and etiology of the severe vomiting of pregnancy. First, twenty-three cases are discussed in which a necropsy was performed, but in which the state of the uterus is not mentioned. Death was attributed by the various observers to certain lesions discovered in other organs than the uterus. In connection with these cases the author discusses Matthews Duncan's views as to the relation between "icterus gravidarum" and the "pernicious" vomiting of pregnancy, and adduces Lomer's statistics on "icterus gravidarum" recently published, which prove that this disease is extraordinarily rare, and that, though more fatal to pregnant women, it is not confined to the female sex. The more common severe vomiting of pregnancy has, the author contends, no relation to this disease.

The author next considers the cases in which observations as to the state of the uterus in association with severe gravid vomiting are recorded, over fifty in number. First, eleven cases where retroversion or flexion of the uterus was present (four related in a former paper, seven new ones). Impaction or incarceration of the gravid uterus was the marked feature of these cases, as shown by the results obtained by reducing the displacement in curing the sickness.

Next are given thirty cases (twenty-two related in a former paper, eight additional ones), in which the gravid uterus occupied an anteverted and anteverted position, and in a tabular form is exhibited the frequency with which impaction or incarceration of the uterus was present in such cases. The table shows that in seventeen of these thirty cases the uterus was also impacted or incarcerated in the pelvis. It is evident, also, that the seventeen impacted cases were the most severe as regards the intensity of the vomiting.

Next are arranged in a tabular form twelve cases in which in-

¹ Abstract of a paper read before the American Gynecological Society, at Washington, 1888.

duration or thickening of the cervix uteri was present. In most of these cases the uterus was also anteverted. In two cases there was present an inflammatory cellulitic tumour, the uterus being also anteverted or flexed. In five cases inflammation of walls or lining of gravid uterus is recorded.

The cases of recorded uterine lesion thus analysed, over fifty in number, exhibit the remarkable frequency with which impaction, incarceration, or detention of the gravid retroflexed or anteverted uterus is found associated with severe sickness. Next in order of frequency comes induration and thickening of the uterine cervix in such cases. The disorders of position, shape, and texture are often associated. Incarceration or impaction of the retroflexed gravid uterus is well known, well recognised as a possible, even as a very serious malady. It is not always accompanied with sickness, though the sickness was the great feature in the eleven above recorded cases. But impaction or incarceration of the anteverted or anteverted gravid uterus is not even as yet admitted as a possible pathological condition. The author considers that the facts and cases now brought forward incontestably prove that it is not only a possible condition, but that it occurs frequently in cases where there is severe gravid vomiting. In seventeen out of thirty cases of anteversion or flexion with impaction or incarceration it was a marked feature. The impaction was so marked in some cases that the uterus could not be pushed upwards, even by repeated attempts. In the balance of the thirty anteversion or flexion cases the uterus was in a condition which is described as "detention" in the pelvis, the uterine body failing to rise out of the pelvis at the proper time. The author attributes this impaction, incarceration, or detention to the uterus being as regards its tissues, especially those of the cervix, rigid; and, as regards its shape, anteverted, whereby the normal elevation and expansion of the uterus are hindered and impeded. Just as the incarceration of the retroflexed gravid uterus is the result of previous retroflexion, so the impaction of the anteverted gravid uterus is the result of previous anteversion. Rigidity of the tissues is an important factor. Copeman's procedure for relief of the sickness is probably beneficial, partly because the rigidity of the tissues is thereby lessened, partly also because the displacement is thereby corrected.

The validity of the foregoing estimate of the importance of "impaction" and "rigidity" is exemplified by the following results of treatment in the cases analysed:

Eleven retroversion cases. In one sickness suspended for a time by elevating the fundus; replacement could not be maintained; abortion. In one treatment not known. In nine cases, uterus replaced; cure of the sickness in all of them.

Seventeen impaction and anteversion cases. In eleven impaction not remedied, in three of these death. In six out of the eleven abortion induced, with two deaths and four recoveries and cures. In two of the eleven natural abortion; one died and one recovered. In six impaction was effectually treated; by manual effort in four, by rest, etc., in two, cure of the sickness in all six. In five cases of anteversion, or flexion with detention of uterus in pelvis only, manipulative reduction effected in three cases, in two natural elevation, cure of sickness in all. There are seven other cases where detention or impaction were not so evident, or in which relief obtained might be assignable to some other cause than treatment of the displacement.

The vomiting of pregnancy appears to be a reflex act, intensified by resistance to expansion of the uterus, which resistance is, the author contends, most severe in those cases where the uterine cervix is rigid and the organ flexed before pregnancy occurs. The sickness is more liable to occur in cases where the nerve centres are in a state of feebleness, and, consequently, more excitable.

In support of the views advanced, the author urges the remarkable parallelism between cases of very severe vomiting in the non-gravid condition where the uterus is acutely flexed, of which he has published nearly twenty cases, and the cases now under consideration; also the complete relief of the sickness obtained by rectifying the position and shape of the uterus in both classes of cases.

HOSPITALS AND WORKING-MEN GOVERNORS.—Evidence is being continually afforded in the provincial reports which reach us of the interest which the working classes take in hospital work and organisation. At a recent meeting of the governors of the Royal Infirmary, Newcastle, the chairman said some of the working-men governors had been looking after the interests of the patients.

TOXICOLOGICAL MEMORANDA.

RECOVERY FROM A LARGE DOSE OF SULPHATE OF ATROPINE.

Mrs. P. was under my treatment for iritis, complicated by an attack of intermittent fever. The iritis was being treated by the application of a solution of sulphate of atropine, 4 grains to the ounce of water. As she had had little sleep for several nights, I prescribed a draught of bromide of ammonia, which was sent up to the house at about 7 P.M. At 8 P.M. the same night I received a note from Mr. P., saying that he had given his wife the wrong medicine, having taken the bottle in the dark and not looked at the label. I arrived at the house about ten minutes after the medicine had been given, and found that Mrs. P. had swallowed about seven drachms of the solution of sulphate of atropine, containing three grains and a half of sulphate of atropine. Mr. P. had, on finding out his mistake, given two large tumblerfuls of warm water, but she had not yet been sick. I at once gave twenty grains of sulphate of zinc in warm water, followed almost immediately by mustard and water. This had the effect of making her violently sick, the stomach being, I believe, almost completely emptied. Mrs. P. complained on my arrival of a feeling of numbness with gradually increasing blindness, and, before being sick, became quite insensible. We carried her to a couch, and I covered her with warm blankets; I then gave a large quantity of very strong brandy and water, which was fortunately retained. The pupils were now widely dilated, and the extremities felt cold; the pulse was, however, fairly regular, though weak, and beat at about 70 to the minute. The breathing was regular, but interrupted at intervals by convulsions, with clenching of the teeth and hands. In about an hour and a half the spasms had entirely ceased, and the pulse and breathing were regular. Mrs. P. was completely insensible for nine hours; at the end of that time she began to show signs of returning consciousness, which rapidly passed into a state of busy delirium, with occasional intervals of sensibility. Fever set in in the afternoon, and the pulse became rapid and weak, with a short catchy respiration, her condition being very critical for some two hours; but a quiet sleep for about three hours did a great deal of good, and on awakening Mrs. P. was quite sensible, although unable to speak distinctly or to taste anything. Recovery was now uninterrupted as far as the sulphate of atropine was concerned, although the fever gave some subsequent trouble.

E. A. O. TRAVERS, M.R.C.S., L.R.C.P.,
Residency Surgeon, Sungei Ujong, Malay Peninsula.

A REMARKABLE CASE OF MORPHINE ADDICTION.

A. T., aged 28, of very powerful physique, often riding fifty, sixty, and even a hundred miles a day. On May 13th he stated that for the last few hours he had difficulty in swallowing and a stiff neck. On May 14th the pulse was 96, temperature 100.5°. On May 16th, at 8 A.M., he had become much worse: marked and permanent trismus; severe spasms of the neck and back, the sterno-mastoids standing out like cords; profuse perspiration and trembling of the hands; pulse 100; temperature 100.5°; pupils dilated, acting but slightly to light. I was now for the first time informed that for years he had been a slave to the opium habit, giving as an excuse the pain caused by a large inguinal rupture, which could not be retained by a truss. He was also in the habit of taking chloral and alcoholic stimulants freely. His arms and legs are covered with scars caused by the hypodermic needle. From himself and his wife (checked by the known quantities supplied by different druggists) it appears that for months past his regular daily quantity of the injectio morphine hypodermica P.B. has been one ounce, and the last few days he thinks he has taken more. This means 40 grains of acetate of morphine every twenty-four hours, equal to 320 grains of opium, or 10 ounces of tincture of opium. Curiously enough, this is exactly the quantity De Quincey was taking when he gradually began to reduce his dose.

The morphine I at once stopped, and twice a day injected one-hundredth of a grain of digitalin and one-hundredth of atropine. So strong was the opium craving that I allowed him to believe he was getting a grain and a half of morphine with each injection. On May 17th and 18th his condition was worse; spasms were brought on by the slightest jar or draught of air; he slept only for a few minutes at a time; very restless, jumping out of bed every five minutes; spasms of intercostal and lumbar muscles very severe and frequent; pulse very hurried; temperature 100°;